

We Claim:

1. A cooled discharge unit comprising
- a discharge pipe,
- a cooling jacket having a U-shaped form in cross section and disposed on said
- 5 discharge pipe,
- a lid covering said cooling jacket and said discharge pipe,
- a lug in the form of a truncated cone made in said lid from the side facing the
- discharge pipe,
- a through cylindrical aperture made in said lug, a longitudinal axis of which
- 10 coinciding with a longitudinal axis of said discharge pipe,
- a group of apertures made in said lid and serving to remove a coolant from said
- cooling jacket,
- a collector for feeding the coolant into the jacket and positioned on said jacket
- from the side opposite said lid,
- 15 a group of apertures made in said collector for supplying the coolant to said
- cooling jacket,
- a discharge gate comprising a pipe, on one end of which, facing said lug, is
- positioned a cone-shaped tip, on the other end a lid with an aperture, adjacent which is
- positioned a pipe for discharge of the coolant,
- 20 a pipe for supplying the coolant, positioned coaxially with said pipe of the
- discharge gate in said aperture of the lid, one end of which being positioned adjacent the
- cone-shaped tip, another end protruding outside said lid.

2. A discharge unit of claim 1 wherein the cone-shaped tip is made of one piece
- and consists of

a first truncated cone having a large base and a smaller base and being rigidly secured by the large base to said pipe of the discharge gate,

a second truncated cone having a large base and a smaller base, wherein the large base of said second truncated cone is the smaller base of said first truncated cone,

5 a third cone having a base which is the smaller base of said second truncated cone.

3. A discharge unit of claim 2 wherein said first truncated cone and said second truncated cone are made hollow.

4. A discharge unit of claim 1 wherein the longitudinal axis of said discharge pipe is shifted toward a round portion of said U-shaped jacket.

10 5. A cooled induction melter comprising

a housing, side walls and bottom of which are made of metal pipes disposed with a gap relative to each other and combined by a collector for supplying and discharging a coolant,

a hollow cooled lid provided with pipes for supplying and discharging the coolant,

15 pipes for loading a mixture of liquid radioactive wastes and vitrification agents, pipes for discharge of waste gases, pipes for returning filtrate and a port for technological servicing positioned in said lid,

a bushing positioned in said lid, the geometrical axis of which being parallel to the axis of said housing and the length of which being somewhat greater than the thickness of
20 said lid,

a discharge gate positioned in said bushing and provided with a drive for vertical displacement,

at least one pipe for positioning sensors of technological parameters of the process,

an inductor positioned adaptable for displacement along the longitudinal axis of said melter and concentrically encompassing said side walls of the housing, the gaps between the pipes of which ensuring transparency of the housing for an electromagnetic field of the inductor, the short inductor serving to create maximum magnetic field strength directly adjacent the moving surface of a melt produced during the input and melting of the mixture of liquid radioactive wastes with the vitrification agents,

a means for moving said inductor along the longitudinal axis of said melter,

an aperture in said bottom of the housing directly adjacent said wall,

a cooled discharge unit positioned in said aperture, the height of said cooling jacket of said discharge unit determining the minimum melt level, a portion of said cooling jacket being a part of the side wall of the housing and another portion of said cooling jacket facing the melt.

6. A melter of claim 5 wherein said pipe for discharge of waste gases contains a cooling jacket.

7. A melter of claim 5 wherein said port for technological servicing is provided with a cooled lid.

8. A melter of claim 5 wherein sensors selected from the following group are used as sensors of technological parameters: at least two melt surface temperature sensors, a sensor of the pressure of gases above the melt surface, a sensor of the temperature of gases above the melt surface, and a picture monitor.

9. An installation for vitrification of liquid heterogeneous radioactive wastes comprising

a mixer provided with a means for mixing components, having an input, a second input, and an output,

a doser of vitrification agent additives, having an output coupled to said input of said mixer,

a doser of heterogeneous liquid radioactive wastes, connected by its output to said second input of said mixer,

5 a vessel-accumulator provided with a means for homogenization of components, having an input coupled to said output of said mixer and an output,

a vortex apparatus serving to process the mixture of liquid radioactive wastes in a vortex layer, having an input connected to said output of said vessel-accumulator, and an output provided with a doser,

10 a cooled induction melter with a movable inductor, having a first input connected to said output of said doser of the vortex apparatus, a second input, a first output for discharge of obtained melt of vitrified radioactive wastes and a second output for discharge of waste gases,

a means for filtering waste gas having successively mounted coarse filters and fine filters, having an input connected to said second output of said melter, and an output,

a condenser for condensing liquid vapors released from said melter, having an input connected to said output of said means for filtering waste gas and an output,

a means for capturing gaseous toxic components, including an absorber, heater, catalytic reactor and condenser, and having an input coupled to an output of said condenser, and an output coupled to the atmosphere.

10. An installation for vitrification of liquid radioactive wastes comprising

a vessel for receiving a dosed portion of homogeneous liquid radioactive wastes and collecting concentrated homogeneous liquid radioactive wastes, the vessel being

linked to a collector of liquid radioactive wastes and having first and second inputs and an output,

an evaporator having an input, provided with a gate and coupled to said output of said vessel to receive radioactive wastes, and having a first output coupled to second input of said vessel to receive radioactive wastes, and a second output,

a separator for separating droplets of liquid from the steam-gaseous mixture, having an input connected to said second output of said evaporator, and having an output,

a condenser for condensing steam having an input coupled to said output of said separator, and an output for the discharge of a condensate,

a mixer provided with a means for mixing components, having an input provided with a gate and connected to said output of said vessel to receive concentrated homogeneous liquid radioactive wastes, a second input, third input and output,

a doser of vitrification agent additives, having an output coupled to said second input of said mixer,

a doser of heterogeneous liquid radioactive wastes, connected by its output to said third input of said mixer,

a vessel-accumulator provided with a means for homogenization of components, having an input coupled to said output of said mixer and an output,

a vortex apparatus serving to process the mixture of liquid radioactive wastes in a vortex layer, having an input connected to said output of said vessel-accumulator, and an output provided with a doser,

a water-cooled induction melter with a movable inductor, having a first input connected to said output of said doser of the vortex apparatus, a second input, a first

output for discharge of obtained melt of vitrified radioactive wastes and a second output for discharge of waste gases,

a means for filtering waste gas having successively mounted coarse filters and fine filters, having an input connected to said second output of said melter, and an output,

5 a second condenser for condensing liquid vapors released from said melter, having an input connected to said output of said means for filtering waste gas and an output,

a means for capturing gaseous toxic components, including an absorber, heater, catalytic reactor and condenser, and having an input coupled to an output of said second condenser, and an output coupled to the atmosphere.

10 11. An installation of claim 10 wherein said coarse filter is coupled to said water-cooled induction melter.